OSIRIS: Ocean, Sea-Ice and Rain Investigations

A UK-wide programme of research in preparation for SWOT

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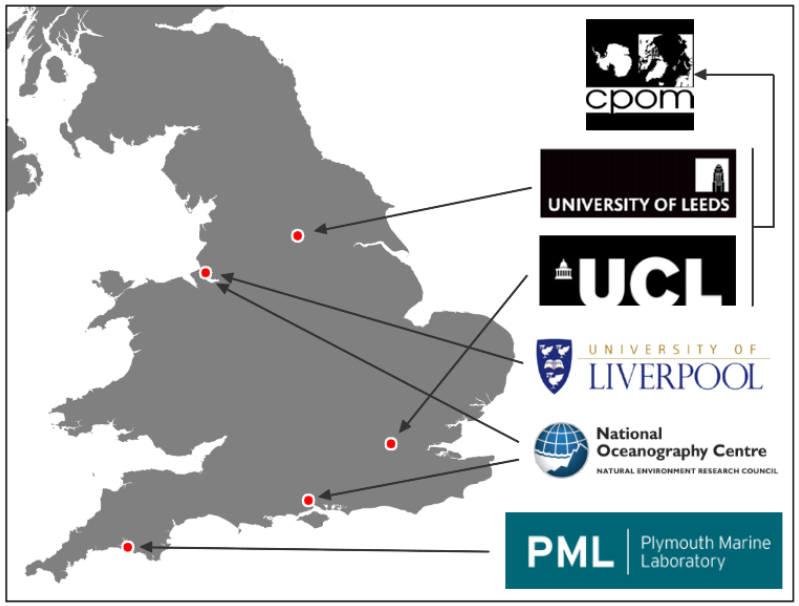
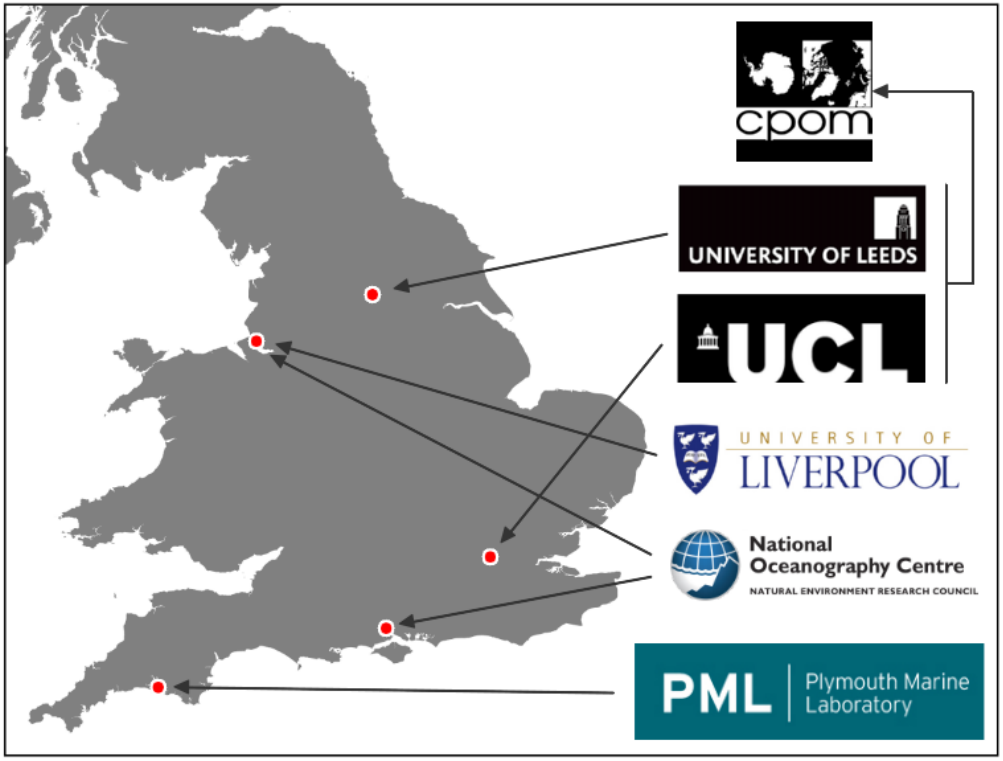


UK SPACE AGENCY

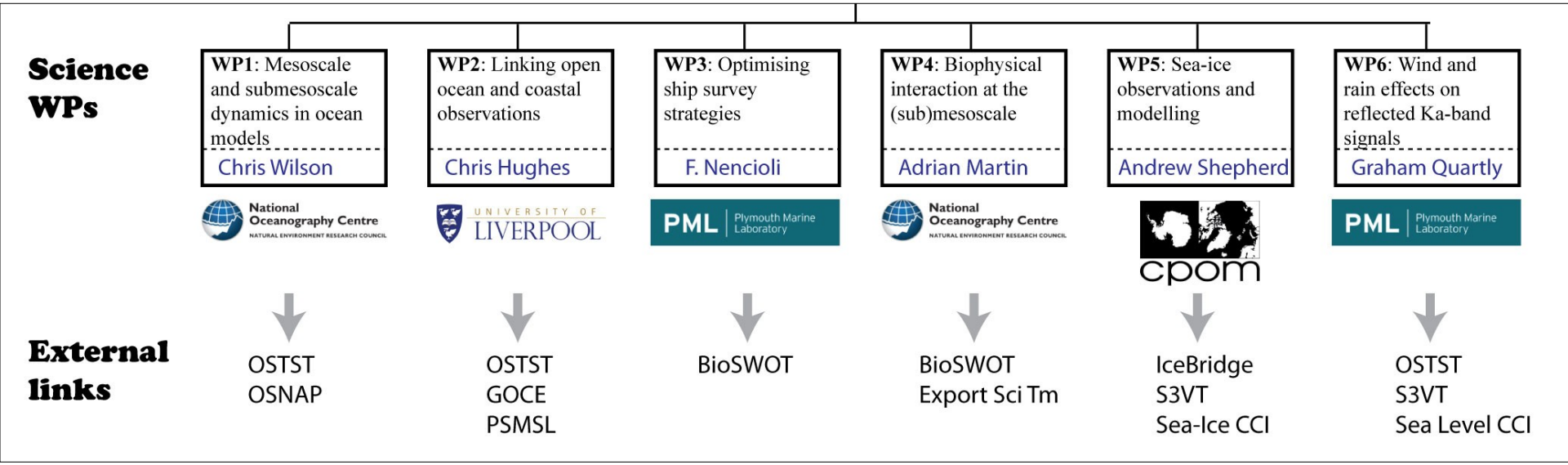
National Centre for Earth Observation
NATURAL ENVIRONMENT RESEARCH COUNCIL

The OSIRIS consortium



- Expertise from **seven investigators** from **five UK organizations**
- Contribution to **four SWOT priority area** for oceanography and **two secondary priorities** for the science team
- **Six work packages** covering open ocean and coastal oceanography, sea-ice and atmospheric effects on instrumental performance

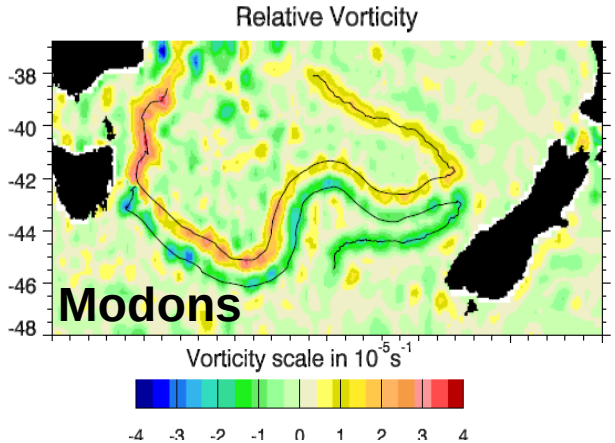
The OSIRIS consortium

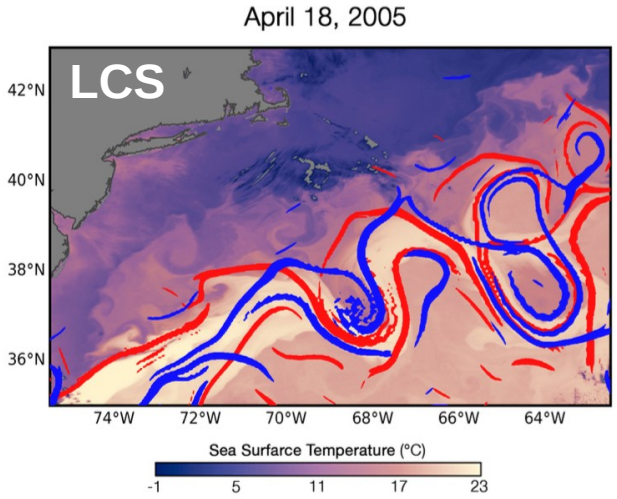


- **Six work packages** covering open ocean and coastal oceanography, sea-ice and atmospheric effects on instrumental performance
- Make use of both **model outputs** and existing **satellite data**
- Activities include aspects that are **already funded** and others that will require **subsequent successful funding bids**

Numerical models: open ocean processes

➔ *WP1: Mesoscale and submesoscale dynamics in ocean models*





WP1.1: Small-scale eddes and eddy mean-flow interactions

(modons, subpolar region, steep topography)

WP1.2: Constrained stochastic eddy parametrization for ocean models

WP1.3: Characterizing mesoscale to sub-mesoscale dynamics, transport and mixing (through LCS)

Make use of SWOT simulator to assess potential impact of SWOT observations

Contacts: Chris W. Hughes (*cwh@liv.ac.uk*) & Chris Wilson (*cwi@noc.ac.uk*)

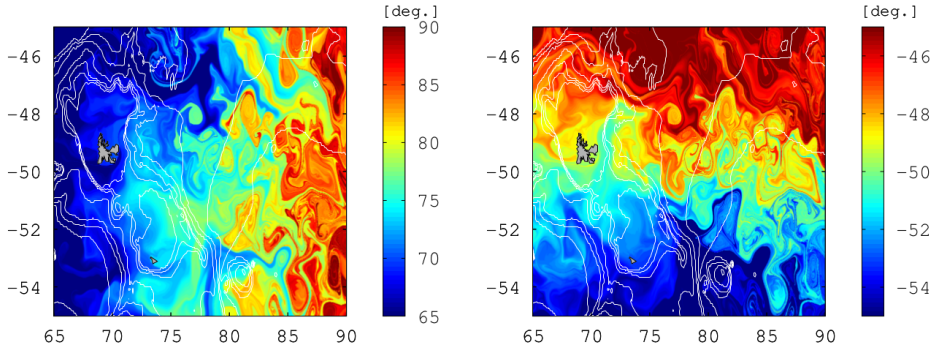
Satellite data: coastal ocean, in-situ & biophysical interactions

➔ *WP2: Linking open ocean and coastal SSH observations*

Contact: Chris W. Hughes (*cwh@liv.ac.uk*)

➔ *WP3: Near-real time optimization of ship-based observations*

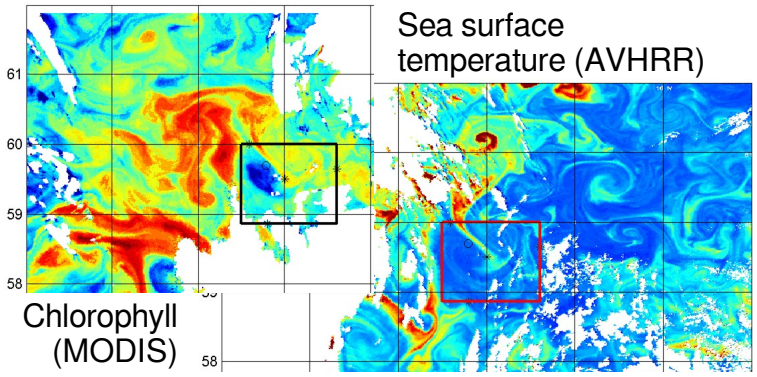
SPASSO: Software Package for an Adaptive Satellite-based Sampling for Ocean campaigns



Contact: F. Nencioli (*fne@pml.ac.uk*)

➔ *WP4: Biophysical interactions at the (sub)mesoscale*

Investigate dynamics of **physical-biogeochemical** interactions in regions of **intense mesoscale stirring** combining remote sensing and in-situ observations

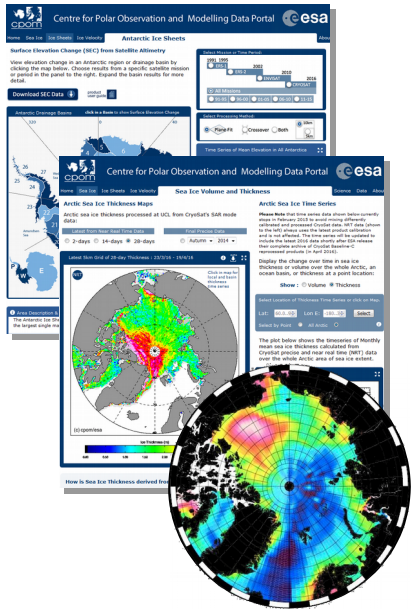


Contact: Adrian Martin (*adrian.martin@noc.ac.uk*)

Effects on instrumental performance

➔ *WP5: Sea-ice observations and modelling*

Prepare framework to interpret SWOT data in those region and assess their potential to **provide essential climate variables** (ECV's)

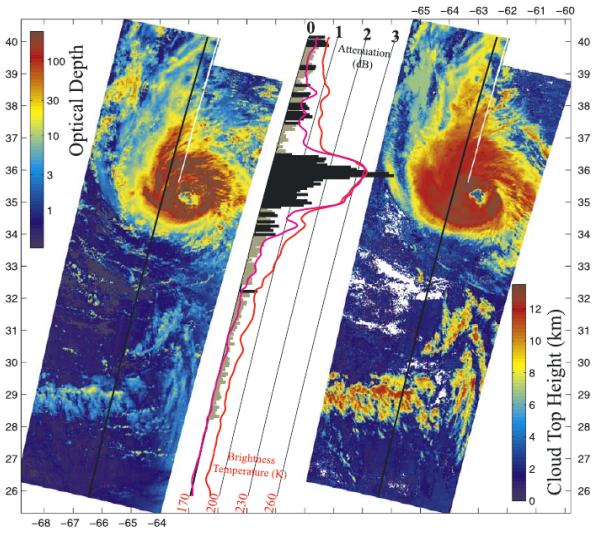


Contacts: Andrew Shepherd (*a.shepherd@leeds.ac.uk*) & Steven Baker (*steven.baker@ucl.ac.uk*)

➔ *WP6: Wind and rain effects on reflected Ka-band signal*

Analysis on **wind and rain effects on strength of return signal** based on AltiKa observations

Contribute to **SWOT algorithm design**



Contact: Graham Quartly (gqu@pml.ac.uk)

VORTICES Project

National Oceanography Centre
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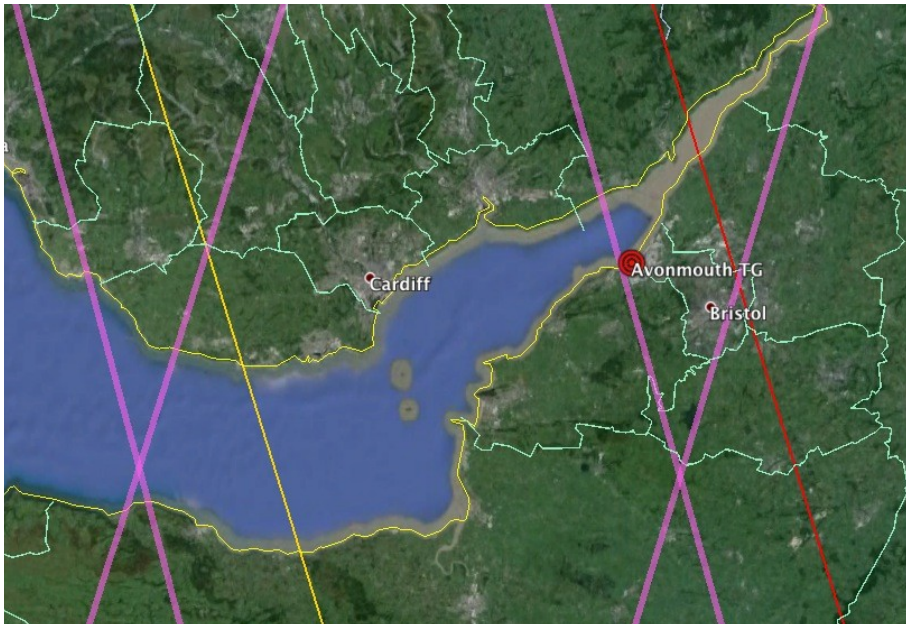
- See also the work by NOC in the **VORTICES poster** by Christine Gommenginger et al.
- One key area for activities during the fast repeat phase is the Bristol Channel / Severn Estuary



The Bristol Channel with SWOT calibration pass 19 (nadir track in red, swath edge in yellow), Sentinel-3 A tracks (purple) and the Tide Gauge at Avonmouth

Five activities are proposed:

- **Algorithm development and testing**
- **Calibration/Validation vs in situ measurements and other satellites**
- **Temporal and spatial variability of sea surface height, geostrophic currents and ageostrophic contributions to ocean circulation**
- **Studies of ocean mesoscale and sub-mesoscale processes and their parameterisations in models**
- **Analysis of high-frequency processes and their impact on land- ocean carbon fluxes in estuaries**